AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

COMPLETE LISTING OF THE CLAIMS:

Claims 1-42 : (Canceled)

Claim 43 : (New) A strain sensor, comprising: an optical waveguide having a plurality of Bragg gratings spaced lengthwise along the waveguide, each Bragg grating having a reflectivity for reflecting light at a different characteristic wavelength which changes in dependence upon a change of physical length of at least part of the respective Bragg grating, the reflectivity of Bragg gratings which reflect at characteristic wavelengths which are adjacent to each other being different for discriminating between adjacent Bragg gratings.

Claim 44 : (New) The strain sensor according to claim 43, in which the Bragg gratings which reflect at adjacent wavelengths are configured such that one of the Bragg gratings reflects the light at one characteristic wavelength, and the Bragg grating adjacent in wavelength is configured to reflect the light at two characteristic wavelengths.

Claim 45 : (New) The strain sensor according to claim 44, in which the Bragg grating which reflects the light at two wavelengths is configured such that the two characteristic wavelengths are separated by at least a width of the reflectivity of the Bragg grating which reflects at the adjacent wavelength.

Claim 46 : (New) The strain sensor according to claim 43, in which the optical waveguide comprises an optical fiber.

Claim 47 : (New) The strain sensor according to claim 43, in which each Bragg grating has a pitch, and wherein a change in the characteristic wavelength is in consequence of a change in the pitch of the Bragg grating.

Claim 48 : (New) The strain sensor according to claim 47, in which the optical waveguide is an optical fiber that includes a photo-refractive dopant, and in which each Bragg grating is optically written into the optical fiber.

Claim 49 : (New) The strain sensor according to claim 48, in which the optical fiber comprises silica doped with germanium oxide.

Claim 50 : (New) The strain sensor according to claim 43, in which the different Bragg gratings are operative for reflecting light at different numbers of characteristic wavelengths.

Claim 51 : (New) An apparatus for measuring strain, comprising: a strain sensor including an optical waveguide having a plurality of Bragg gratings spaced lengthwise along the waveguide, each Bragg grating having a reflectivity for reflecting light at a different characteristic wavelength which changes in dependence upon a change of physical length of at least part of the respective Bragg grating, the reflectivity of Bragg gratings which reflect at characteristic wavelengths which are adjacent to each other being different for discriminating between adjacent Bragg gratings; a light source operable for applying the light to the waveguide, the light having a wavelength range which covers at least a range of wavelengths over which the Bragg gratings reflect; and detector means for determining a change of characteristic wavelength at which the Bragg gratings reflect light, the change being indicative of a change in length of at least a part of the respective Bragg grating.

Claim 52 : (New) The apparatus according to claim 51, in which the detector means determines the change in characteristic wavelength by measuring the wavelengths at which the strain sensor reflects the light.

Claim 53 : (New) The apparatus according to claim 51, in which the detector means measures the light transmitted by the strain sensor and determines the change of characteristic wavelength by measuring the change in wavelength at which light transmission is attenuated.

Claim 54 : (New) The apparatus according to claim 51, in which the detector means further comprises means for utilizing a relative magnitude of an intensity of reflected light or a relative magnitude of an intensity at which light transmission is attenuated to discriminate between the Bragg gratings which are adjacent in wavelength.

Claim 55 : (New) A method of measuring strain, comprising the steps of: providing a strain sensor including an optical waveguide having a plurality of Bragg gratings spaced lengthwise along the waveguide, each Bragg grating having a reflectivity for reflecting light at a different characteristic wavelength which changes in dependence upon a change of physical length of at least part of the respective Bragg grating, the reflectivity of Bragg gratings which reflect at characteristic wavelengths which are adjacent to each other being different for discriminating between adjacent Bragg gratings; applying the light to the waveguide, the light having a wavelength range which covers at least a range of wavelengths over which the Bragg gratings reflect the light; and detecting a change in the characteristic wavelength at which the Bragg gratings reflect the light.

Claim 56 : (New) The method according to claim 55, and further comprising the step of detecting the change in the characteristic wavelength by measuring the wavelengths at which the strain sensor reflects the light.

Claim 57 : (New) The method according to claim 56, and further comprising the step of detecting the change in the characteristic wavelength by measuring the wavelengths at which the transmission of the light through the strain sensor is attenuated.

Claim 58 : (New) The method according to claim 57, and further comprising the step of detecting a relative magnitude of an intensity of reflected light or a relative magnitude of an intensity at which transmitted light is attenuated to discriminate between the Bragg gratings which are adjacent in wavelength.

Claim 59 : (New) The method according to claim 55, and further comprising the step of sweeping the wavelength of the light applied to the strain sensor.

Claim 60 : (New) The method according to claim 55, in which, when it is desired to measure the strain within an object, further comprises the step of securing a part of the waveguide having at least a part of one of the Bragg gratings to the object such that a change in a physical length of at least a part of the object causes a change in a physical length of at least the part of the one Bragg grating.

Claim 61 : (New) The method according to claim 55, in which, when it is desired to measure a temperature of an object, further comprises the step of placing a part of the waveguide having at least a part of one of the Bragg gratings in thermal contact with the object such that a change in the temperature of the object causes a change in a physical length of at least the part of the one Bragg grating.

Claim 62 : (New) A strain sensor, comprising: an optical waveguide having a plurality of Bragg gratings spaced lengthwise along the waveguide, each Bragg grating having a reflectivity for reflecting light at a different characteristic wavelength which changes in dependence upon a change of physical length of at least part of the respective Bragg grating, the reflectivity of Bragg gratings which reflect at different characteristic wavelengths being different for discriminating between the Bragg gratings.

Claim 63 : (New) A strain sensor, comprising: an optical waveguide having a plurality of Bragg gratings spaced lengthwise along the waveguide, each Bragg grating having a reflectivity for reflecting light at a different characteristic wavelength which changes in dependence upon a change of physical length of at least part of the respective Bragg grating, the different Bragg gratings being operative for reflecting light at different numbers of characteristic wavelengths.